WHAT IS CLAIMED IS:

1. A bioprosthetic heart valve comprising an acellular matrix and isolated myofibroblasts wherein at least 60% of the total collagen produced by said myofibroblasts is type I collagen.

2. The valve of claim 1, wherein said myofibroblasts produce at least 2-fold greater type I collagen compared to type III collagen.

3. The valve of claim 1, wherein said myofibroblasts produce one or more extracellular matrix components selected from the group consisting of fibronectin, elastin, and glycosaminoglycan.

4. The valve of claim 3, wherein said glycosaminoglycan is chondroitin sulfate or hyaluronic acid.

5. A valve comprising an acellular matrix and an isolated myofibroblast, wherein less than 25% of total collagen production by said myofibroblast is type III collagen.

6. The valve of claim 5, wherein less than 20% of total collagen production by said myofibroblast is type III collagen.

7. The valve of claim 5, wherein less than 15% of total collagen production by said myofibroblast is type III collagen.

8. The valve of claim 5, wherein said myofibroblast is derived from mammalian heart leaflet interstitial tissue.

9. The valve of claim 5, wherein said myofibroblast is derived from a mammalian vascular or dermal tissue.

10. The valve of claim 5, wherein said myofibroblast is derived from human heart leaflet interstitial tissue.

11. A method of enhancing production of type I collagen by an isolated myofibroblast, comprising culturing said myofibroblast under pulsatile flow conditions.

12. The method of claim 11, wherein said myofibroblast is cultured in the presence of basic fibroblast growth factor.

13. The method of claim 11, wherein said myofibroblast is cultured in endothelial cell-conditioned media.

14. The method of claim 11, wherein said myofibrobast is cultured in the presence of an isolated endothelial cell.

15. A method of enhancing viability and contractile activity of myofibroblasts in vitro comprising culturing said myofibroblast under pulsatile flow conditions.

16. The method of claim 15, wherein said myofibroblast is cultured in endothelial cell-conditioned media.

17. The method of claim 15, wherein said myofibrobast is cultured in the presence of an isolated endothelial cell.

18. The method of claim 15, wherein said myofibroblast is cultured in the presence of a purified endothelial cell-derived growth factor, wherein said growth factor inhibits apoptosis of said myofibroblast.

19. An isolated myofibroblast, wherein said myofibroblast is genetically altered to increase type I collagen production relative to type III collagen production.

20. A bioprosthetic heart valve comprising the myofibroblast of claim 19.

21. A method of manufacturing an artificial heart valve, comprising

(a) providing an acellular matrix,

(b) seeding said matrix with isolated myofibroblasts; and

(c) culturing said myofibroblasts under pulsatile flow conditions.

22. The method of claim 21, wherein said myofibroblasts are derived from an intended recipient from an intended recipient of said centrifugal heart valve.